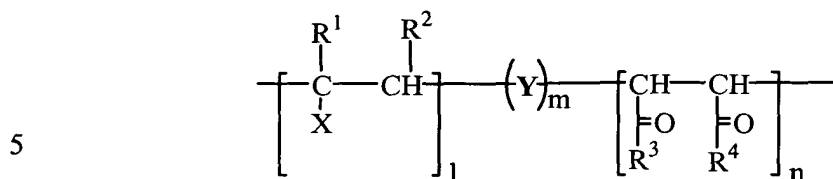


What is claimed is:

1. A concrete admixture additive having the formula:



wherein

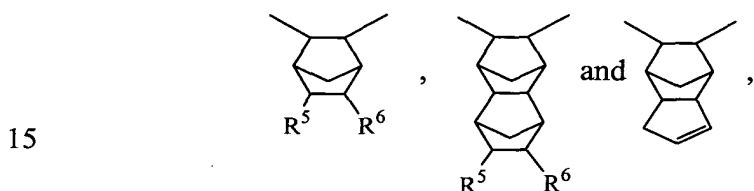
$\text{R}^1$  is hydrogen or methyl;

$\text{R}^2$  is hydrogen or methyl;

$\text{X}$  is selected from the group consisting of  $\text{C}_6\text{-C}_{10}$  aromatic group,  $\text{C}_6\text{-C}_{10}$  sulfonated aromatic group,  $\text{C}_5\text{-C}_6$  cyclic alkyl group, and  $\text{C}_{1-10}$  alkoxy group;

10

$\text{Y}$  is selected from the group consisting of  $\text{C}_2\text{-C}_5$  saturated aliphatic group,  $\text{C}_2\text{-C}_5$  unsaturated aliphatic group,



wherein  $\text{R}^5$  and  $\text{R}^6$  are respectively selected from the group consisting of hydrogen, halogen,  $\text{C}_{1-10}$  alkyl group,  $\text{C}_{6-10}$  aromatic group,  $\text{C}_{6-10}$  fluoroaromatic group,  $\text{C}_{1-10}$  alkoxy group,  $\text{C}_{2-10}$  alkenyl group,  $\text{C}_{7-11}$  aromatic alkyl group,  $\text{C}_{8-12}$  aromatic alkenyl group and

20

$\text{C}_{7-11}$  alkyl aromatic group;

$\text{R}^3$  and  $\text{R}^4$  are respectively selected from the group consisting of  $\text{NHR}^7$ ,  $\text{OR}^7$ ,  $\text{OH}$  and  $\text{O}^-\text{M}^+$ , wherein  $\text{M}^+$  is an alkaline metal cation, alkaline earth metal cation, or ammonium,  $\text{R}^7$  is an oxyalkenyl or polyoxyalkenyl, having the formula  $(\text{ZO})_p\text{R}^8$ , wherein  $\text{Z}$  is a  $\text{C}_2\text{-C}_5$  aliphatic group,  $p$  is an integer from 5 to 100, and  $\text{R}^8$  is a  $\text{C}_1\text{-C}_5$  aliphatic

25

group or  $\text{C}_6\text{-C}_{10}$  aromatic group;

l is an integer from 0 to 25;  
 m is an integer from 0 to 25; and  
 n is an integer from 0 to 50;  
 provided at least two of l, m, and n are not zero.

5 2. The concrete admixture additive according to claim 1, wherein

l is an integer from 0 to 10;  
 m is an integer from 0 to 10; and  
 n is an integer from 0 to 25.

3. The concrete admixture additive according to claim 1, wherein

10 l is an integer from 0 to 5;  
 m is an integer from 0 to 5; and  
 n is an integer from 0 to 25.

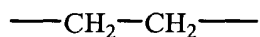
4. The concrete admixture additive according to claim 1, wherein  $R^1$  is hydrogen.

5. The concrete admixture additive according to claim 1, wherein  $R^2$  is hydrogen.

15 6. The concrete admixture additive according to claim 1, wherein X is phenyl.

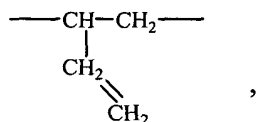
7. The concrete admixture additive according to claim 1, wherein X is sulfonated phenyl.

8. The concrete admixture additive according to claim 1, wherein Y is



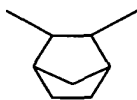
9. The concrete admixture additive according to claim 1, wherein Y is

20  $\text{---CH}_2\text{---CH=CH---CH}_2\text{---}$  ,



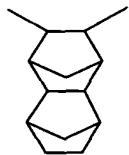
or a mixture of both.

25 10. The concrete admixture additive according to claim 1, wherein Y is



11. The concrete admixture additive according to claim 1, wherein Y is

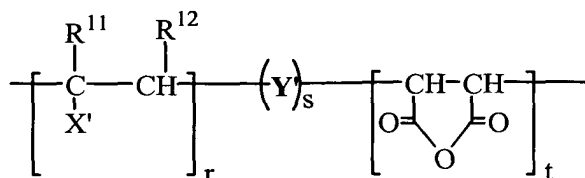
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12. A process for manufacturing a concrete admixture additive, comprising the steps of:

(a) preparing a first reagent containing 1~75% by weight of a polymer having the formula:

10



wherein

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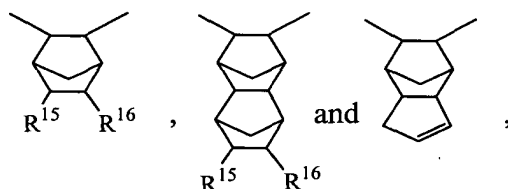
$R^{11}$  is hydrogen or methyl;

$R^{12}$  is hydrogen or methyl;

$X'$  is selected from the group consisting of  $C_6$ - $C_{10}$  aromatic group,  $C_6$ - $C_{10}$  sulfonated aromatic group,  $C_5$ - $C_6$  cyclic aromatic group, and  $C_{1-10}$  alkoxy group;

20

$Y'$  is selected from the group consisting of  $C_2$ - $C_5$  saturated aliphatic group,  $C_2$ - $C_5$  unsaturated aliphatic group,



25

wherein  $R^{15}$  and  $R^{16}$  are respectively selected from the group consisting of hydrogen, halogen,  $C_{1-10}$  alkyl group,  $C_{6-10}$  aromatic group,  $C_{6-10}$  fluoroaromatic group,  $C_{1-10}$  alkoxy

group, C<sub>2-10</sub> alkenyl group, C<sub>7-11</sub> aromatic alkyl group, C<sub>8-12</sub> aromatic alkenyl group, and C<sub>7-11</sub> alkyl aromatic group;

r is an integer from 0 to 25;

s is an integer from 0 to 25; and

5 t is an integer from 0 to 50;

provided at least two of r, s and t are not zero;

(b) reacting the first reagent with a second reagent at a temperature between 20 and 180°C, wherein the second reagent contains 1~75% by weight of at least one oxyalkene or polyoxyalkene having the formula

10  $\text{H}_2\text{N}(\text{Z}'\text{O})_q\text{R}^{18}$  or  $\text{HO}(\text{Z}'\text{O})_q\text{R}^{18}$ ,

wherein

Z' is a C<sub>2</sub>-C<sub>5</sub> aliphatic group;

q is an integer from 5 and 100; and

R<sup>18</sup> is a C<sub>1</sub>-C<sub>5</sub> aliphatic group or C<sub>6</sub>-C<sub>10</sub> aromatic group;

15 (c) reacting the resultant mixture of (b) with an acidic reagent to form a carboxylated polymeric product, wherein the acidic reagent contains 1~10 % by weight of an inorganic acid or sulfuric organic acid; and

(d) treating the carboxylated polymeric product with an alkaline reagent, wherein the alkaline reagent contains 1~10% by weight of a compound having the formula M(OR<sup>19</sup>)<sub>v</sub>,

20 wherein

M is an alkaline metal cation, alkaline earth metal cation, or ammonium;

v is the valence of M; and

R<sup>19</sup> is selected from the group consisting of hydrogen, C<sub>1-10</sub> alkyl group, C<sub>6-10</sub> aromatic group, C<sub>1-10</sub> alkoxy group, C<sub>7-11</sub> aromatic alkyl group, C<sub>8-12</sub> aromatic alkenyl  
25 group, and C<sub>7-11</sub> alkyl aromatic group.

13. The process for manufacturing a concrete admixture additive according to claim 12,  
wherein

r is an integer from 0 to 10;

s is an integer from 0 to 10; and

5 t is an integer from 0 to 25.

14. The process for manufacturing a concrete admixture additive according to claim 12,  
wherein

r is an integer from 0 to 5;

s is an integer from 0 to 5; and

10 t is an integer from 0 to 25.

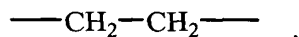
15. The process for manufacturing a concrete admixture additive according to claim 12,  
wherein R<sup>11</sup> is hydrogen.

16. The process for manufacturing a concrete admixture additive according to claim 12,  
wherein R<sup>12</sup> is hydrogen.

15 17. The process for manufacturing a concrete admixture additive according to claim 12,  
wherein X' is phenyl.

18. The process for manufacturing a concrete admixture additive according to claim 12,  
wherein X' is sulfonated phenyl.

19. The process for manufacturing a concrete admixture additive according to claim 12,  
20 wherein Y' is



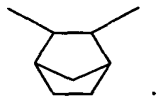
20. The process for manufacturing a concrete admixture additive according to claim 12,  
wherein Y' is  $\text{---CH}_2\text{---CH=CH---CH}_2\text{---}$ ,



or a mixture of both.

21. The process for manufacturing a concrete admixture additive according to claim 12,  
wherein Y' is

5



22. The process for manufacturing a concrete admixture additive according to claim 12,  
wherein Y' is

